

*Appendix A*  
*Technical Specifications and*  
*Drawings*

**TECHNICAL SPECIFICATIONS  
CORRECTIVE MEASURES IMPLEMENTATION  
SUPERIOR TUBE COMPANY, EVANSBURG, PA**

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## **DIVISION 2 - SITE WORK**

### **SECTION 02000 EXCAVATION AND BACKFILLING**

#### **1.0    *General***

#### **1.1    *Work Included***

- A.    Site preparation.
- B.    Clearing and grading.
- C.    Excavation.
- D.    Furnishing and placing borrow materials.
- E.    Off-site disposal of excavated soils.
- F.    Surveying requirements.
- G.    Topsoil placement.
- H.    Decontamination of earthwork equipment.

#### **1.2    *Related Work***

- A.    Section 02225 - Pavement.
- B.    Section 02936 - Seeding.
- C.    Erosion and Sedimentation Control Plan
- D.    Health and Safety Plan.
- E.    Construction Quality Assurance Plan.

#### **1.3    *Submittals***

- A.    Submit borrow source samples and certified test results in accordance with these Specifications at least one week prior to delivery of the material to the Site.
- B.    Submit a detailed implementation plan to the Owner's Representative one week prior to the start of work activities, describing all equipment, materials, and procedures to be

used, a schedule for work activities, and quality control plan.

- C. Submit documentation to Owner's Representative one week prior to start of earthwork activities showing that all appropriate personnel meet OSHA's 29 CFR 1910.120 requirements for hazardous waste operations.

#### **1.4 Protection and Restoration of Property**

- A. Existing monitoring wells, fences, established roads, and other landscape features in or adjacent to the project work area shall be protected during the performance of required work by placing barricades or otherwise restricting access to such areas.
- B. Excavation machinery, paving equipment, and all other heavy equipment, shall be operated with care to prevent damage to structures, trees, utilities and other obstacles. Where required, structures, utilities, trees and other obstacles within or adjacent to the work site shall be braced by suitable means.
- C. On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment the treads or wheels of which are so shaped as to cut or otherwise damage such surfaces. Likewise, any material storage areas set up on paved areas shall be set up so as to not damage such surfaces.
- D. All lawns, paved surfaces, roadways, and structures which have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations.
- E. The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.
- F. The locations of any existing above ground utility service lines and underground utility service and/or pipelines and monitor wells shall be verified by the Contractor prior to commencement of work.

- G. The Contractor must make contact with the applicable utility companies, pipeline companies, and Owner to assist in establishing locations and protection procedures of their utility services, wells, or pipelines prior to commencing construction.
- H. In the event of damage to any existing known utility service or pipelines, the Contractor shall be responsible for incurred costs for the repair or replacement of the damaged lines, in accordance with the applicable codes and regulations of the affected company, as well as all fines, penalties and fees imposed by the affected company. Utility service lines include telephone, water, electrical, and/or gas lines. Pipelines include natural gas pipelines, sewer lines, storm drain lines and/or any plant process or finished product lines.
- I. In the event of damage to any existing monitoring wells at the site, Contractor shall be responsible for incurred costs for the repair or replacement of the damaged well(s) to a condition at least equal to that in which they were found immediately prior to the beginning of operations.
- J. All staging and decontamination areas shall be established in areas approved by the Owner's Representative.
- K. Contractor shall minimize to the extent possible any disturbance of designated wetlands areas.

#### **1.5 Subsurface Conditions**

- A. Work specified under this section shall be satisfactorily executed, regardless of subsurface materials encountered, as shown on the Drawings or as otherwise directed by the Owner's Representative.
- B. Although it is the intention to adhere to the Drawings, the Contractor is informed that the locations of utilities, piping and structures shown on the Drawings are approximate. The Owner's Representative reserves the right to make changes in locations, lines, and grades when such adjustments may be necessary or advantageous.

## **1.6 Survey Lines and Markers**

- A. The Contractor shall establish all baselines required for the performance of the work in accordance with the Drawings. Any new and existing property line markers, control points or baselines shall not be disturbed. In the event that they are disturbed, the Contractor shall be responsible for their replacement. Owner's Representative will provide known survey reference points in the vicinity of the excavation areas.

## **2.0 Materials**

### **2.1 General Fill**

- A. Material used as general fill materials to achieve the required subgrades prior to placement of topsoil (at Outfalls 002 and 004) or aggregate subbase and asphalt pavement (SWMU 17) shall be imported, clean earth classifying as CL, ML, CL-ML, SC, SW, SP or SM in accordance with ASTM D2487 recovered from approved borrow sources. It shall not contain objectionable quantities of debris, roots, or organic matter and shall be free of frozen materials, rock or gravel larger than 2 inches in any dimension.

### **2.2 Topsoil**

- A. Topsoil shall be imported, friable loamy soil (as classified by the U. S. Department of Agriculture Handbook No. 18, Soil Survey Manual); free of subsoil, roots, grass, excessive amounts of weeds, stone, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 3 percent and a maximum of 10 percent organic matter. No more than 15 percent by weight shall be larger than a No. 10 U.S. Standard Sieve.

### **2.3 Borrow Source Quality**

- A. To ensure that no contaminated materials are imported to the site as part of the Work, Contractor shall submit two copies of certified test results from previous sampling of the proposed borrow source(s), or a certification from the

borrow source that the material is virgin, uncontaminated material.

#### **2.4    *Water for Compaction***

- A.    Water for compaction moisture adjustment, decontamination, and other uses is available at the job site. Contractor shall only obtain water from within the job site as designated by Owner's Representative.

#### **3.0    *Execution***

##### **3.1    *Clearing***

- A.    All areas requiring excavation shall be cleared of all vegetation and obstructions that would interfere with excavation operations. Such areas shall be stripped of all grass, plant, and organic matter prior to excavation by cutting the vegetation flush with the ground surface. Clearing and vegetation disturbance in areas adjacent to the excavation areas shall be minimized to the extent possible.
- B.    Contractor shall not move or relocate equipment or structures without prior approval of the Owner's Representative.
- C.    Stripped materials shall be handled in the manner approved by the Owner's Representative.

##### **3.2    *Excavation - General***

- A.    Excavation shall conform to the lines, grades, dimensions, and elevations indicated on the Drawings and/or staked in the field, and shall be in accordance with all applicable OSHA regulations. Contractor shall be responsible for repairing any damage to site features caused during excavation activities at no additional cost to Owner. Contractor shall bear full responsibility for maintaining the stability of excavated faces, including prevention of sloughing of material from excavated faces.
- B.    It is expressly understood that no excavated materials shall be removed from the Site or disposed of by the Contractor

except as directed or approved by the Owner's Representative.

- C. Excavation shall not extent beyond or below the designated excavation areas.
- D. Prior to excavation in paved areas, Contractor shall make appropriate saw cuts through the existing asphalt to facilitate removal and to minimize damage to adjacent asphalt surfaces during excavation.
- E. Contractor shall be responsible for any and all traffic control and related measures that are required to facilitate proper excavation, loading and backfilling.

### 3.3 *Excavation Near Existing Structures*

- A. The Contractor's attention is directed to the fact that storm drains, water supply lines, and other underground utilities exist within or immediately adjacent to some of the excavation areas. Most of these utilities are indicated on the Drawings; however, no attempt has been made to show all of the services, and the completeness and accuracy of the information presented are unverified and without guarantee. This information is supplied for the purpose of providing the Contractor with an indication as to the approximate locations of utilities at the work areas so that Contractor will be made aware of probable obstructions and the extent to which these may affect construction.
- B. All storm drains and underground utility lines will be identified in the field by the Owner's Representative and Contractor prior to the start of earthwork activities. All such locations shall be plainly marked by Contractor with coded paint symbols on pavement or by marked stakes in the ground.
- C. As the excavation approaches pipes, conduits, or other underground structures, digging by conventional trenching machine methods shall be discontinued. Only manual methods of excavating shall be employed around buried utilities.



### **3.4    *Protection of Existing Structures***

- A.    All existing pipes, poles, wells, wires, fences, monitoring wells, and other structures which must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. In case of damage, the Contractor shall notify the Owner so that proper steps may be taken to repair any and all damage done. All damage shall be repaired by the Contractor at Contractor's expense; or, if not promptly done by him, the Owner may have the repairs made at the expense of the Contractor.
- B.    When fences interfere with the Contractor's operations, he shall remove and, unless otherwise specified, later restore them to a condition at least as good as that in which they were found immediately before the work began, all without additional compensation. No fences shall be removed without prior approval from the Owner's Representative.

### **3.5    *Drainage***

- A.    Diversion ditches, dikes and grading shall be provided and maintained by the Contractor as necessary during construction to limit external surface water from entering Work areas.
- B.    At all times during construction, the Contractor shall temporarily provide, place, and maintain ample means and devices with which to remove promptly, and properly dispose of, all water entering trenches and other excavations, or water that may flow along or across the work site. Water shall be removed in a manner to minimize the transportation of suspended sediments. Excavations shall be drained or pumped dry as necessary prior to the placement or construction of materials or structures within such excavations.
- C.    All stormwater pumped or drained from the Work area shall be handled in a manner satisfactory to the Owner's Representative, without undue interference with other work or damage to pavements, other surfaces, or property.

- D. All finished grades shall be constructed so as to drain freely and in accordance with the drainage patterns established on the Drawings. Where appropriate, drainage shall be directed to swales, inlets, or other appropriate discharge areas.

### **3.6 *Erosion and Sedimentation Control***

- A. Sediment control shall be in accordance with Pennsylvania Erosion and Sedimentation Control requirements and the provisions of the project Specifications and Drawings. Contractor shall supplement the planned erosion and sedimentation control measures as necessary during the Work to adequately restrict the erosion or migration of sediments.

### **3.7 *Stockpiles***

- A. To minimize facility disruptions and double handling of materials, stockpiling shall be avoided to the extent possible. If stockpiling is necessary, stockpiles shall be kept in a neat and well-drained condition, and shall not be left on site for a period greater than one week unless otherwise approved by Owner's Representative. Stockpiles shall only be permitted in areas approved in advance by the Owner's Representative. Adequate erosion and sedimentation control measures shall be installed around any and all stockpiles.

### **3.8 *Filling***

- A. All excavation areas shall be backfilled with imported, clean general fill satisfying the requirements of this Section. Excavation areas to receive vegetation shall be backfilled to within 6 inches of the final design grades so as to allow for topsoil placement. Excavation areas to receive pavement shall be backfilled to within no less than 1 foot below final design grades so as to allow for aggregate subbase and asphalt placement. Excavation areas shall not be backfilled until the Owner's Representative has confirmed that the excavation has been completed, and that the conditions are suitable for backfilling.

- B. Fill materials shall be placed in layers by a bulldozer or other approved method. During the spreading process, all roots, debris, and stones greater in size than those specified shall be removed from the fill areas.
- C. Layers of fill material shall not exceed 8 inches in depth before compaction, unless otherwise specified or approved by the Engineer.
- D. The placing of materials in freezing temperatures is not permitted.
- E. The placing of materials on areas of ponded water or on excessively wet ground as determined by Owner's Representative is not permitted.

### **3.9 *Moisture Control***

- A. The moisture content of materials to be placed on site shall be adjusted in the borrow areas, backfill areas, or other approved areas to obtain the moisture content required to obtain the density specified.

### **3.10 *Dust Control***

- A. Fugitive dust emissions shall be controlled by Contractor to the extent practicable by wetting down dry soil surfaces. Dust control measures and precautions shall also be as specified in the Corrective Measures Health and Safety Plan.

### **3.11 *Compaction***

- A. Each spread layer of material shall be compacted by the use of approved compaction equipment so as to secure a dense, stable, and thoroughly compacted mass. Compaction shall be provided by a minimum of two complete passes of approved compaction equipment.
- B. Areas adjacent to structures and other areas inaccessible to mobile compaction equipment shall be compacted with suitable power-drive tampers or other approved hand-operated devices.
- C. When compaction is to be accomplished by use of hand-operated machine compactors, the layer thickness of each lift

shall not exceed six inches in uncompacted thickness. When compaction is to be accomplished other than by use of hand-operated machine compactors, the layer thickness of each lift shall not exceed eight inches in uncompacted thickness.

- D. Compaction of general fill shall not be less than 90 percent of the maximum dry density as determined by laboratory compaction test ASTM D698 (standard proctor) for areas to receive vegetation, and shall be not less than 95% of the maximum dry density using the same test for areas to receive aggregate subbase and pavement.
- E. If at any time the Owner's Representative judges that the degree of compaction being obtained is insufficient, he/she may halt operations and order that compaction tests in addition to the normal testing schedule be taken at his direction. Areas found deficient in degree of compaction shall be recompacted at the sole expense of the Contractor.

### 3.12 *Tests and Testing*

- A. The optimum moisture content and the maximum density of each type of material used for compacted fill shall be determined by ASTM D698 (Standard Proctor Compaction Test) by the Independent testing laboratory retained by Contractor and approved by Owner's Representative.
- B. Field density tests shall be performed by the Contractor in accordance with ASTM D1556 or ASTM D2922. When using ASTM D2922 for wet density, ASTM D3017 will be used to determine the moisture content of the soil. When using ASTM D1556 for wet density, ASTM D2216 will be used to determine the moisture content of the soil. If used, the nuclear device will be checked and calibrated regularly as per the manufacturer's recommendations.
- C. When test results indicate that compaction density or moisture content is not as specified, the material shall be reworked and recompacted or removed, replaced and recompacted by Contractor to meet specification requirements. All areas requiring recompaction shall be retested to ensure conformance with the specification

requirements. This reworking shall be done at no additional expense to Owner.

### **3.13 *Topsoil Placement and Finishing***

- A. The surface of fill areas to receive vegetation shall be finished to a smooth and compact surface in accordance with the grades and lines shown on the Drawings, or alternate approved plan. Finished surfaces shall be free of depressed areas where water may pond.
- B. Topsoil shall be placed in all areas receiving general fill, areas where topsoil is required to achieve the final grades, areas where bare soil is present as a result of clearing, stripping and/or stockpiling activities (excluding gravel, concrete, and asphalt covered surfaces), and all areas to receive seeding.
- C. Compacted topsoil thickness shall be at least 6 inches at locations where topsoil is scheduled.
- D. Surfaces to receive topsoil shall be scarified to a depth of 2 inches by harrowing or by some other approved method before placement of the topsoil layer. Contractor shall ensure that scarifying methods do not damage the underlying work.
- E. Contractor shall eliminate uneven areas and low spots during topsoil placement. Debris, branches, foreign material, weeds, grass and stones in excess of 2 inches in size shall be removed while spreading. Such materials shall be removed from the site for disposal/reuse, unless otherwise approved by Owner's Representative.
- F. Topsoil shall be placed in a relatively dry state and shall be placed during relatively dry weather.
- G. Topsoil shall be manually spread around areas not to receive topsoil such as trees, plants, roads, and wells.
- H. Placed topsoil shall be lightly compacted to prevent excessive erosion prior to seeding.
- I. Topsoil areas shall be left clean and raked, ready to receive landscaping.

- J. The thicknesses and elevations of all finished surfaces shall be within 0.2 foot of the thicknesses and elevations presented in the Drawings and Technical Specifications or as otherwise approved.
- K. Seeding and stabilization of the topsoil areas shall be in accordance with Section 02936 - Seeding.

#### **3.14 *Handling and Disposal of Contaminated Soils and Sediments***

- A. Prior to excavation, Contractor shall collect and analyze any soil or sediment samples required to complete waste classification and waste acceptance for the materials scheduled for excavation. Analytical test results for the material to be disposed, and the name of the off-site treatment, recycling or disposal facility to be used shall be provided to the Owner's Representative at least one week prior to the start of excavation activities.
- B. To the extent possible, excavated soils shall be directly loaded into trucks or roll-offs for off-site transportation. If materials cannot be transported off-site immediately, materials shall be covered and stored in a secure location approved by the Owner's Representative.
- C. Contractor shall be responsible for the storage, transportation and handling of all contaminated materials in accordance with all applicable local, state and Federal regulations. Contaminated or potentially contaminated materials shall not be removed from the site by Contractor without prior notification to and approval of the Owner's Representative.
- D. Contractor shall properly manifest all contaminated materials that leave the site. Contractor shall supply all of the applicable paper-work, already filled out (neatly typed), ready for signature by the Owner (if required). Contractor shall ensure that all paper-work is complete prior to the off-site shipment of any waste materials.
- E. Contractor shall submit copies of all waste manifests, Bills of Lading, permits, receipts, or other documentation of waste transportation and disposal to the Owner's Representative with 24 hours of availability.

### **3.15 *Equipment Decontamination***

- A. Earthwork and other equipment used to handle contaminated or potentially contaminated materials shall be decontaminated prior to leaving the Site or entering non-contaminated areas of the Site. Decontamination shall include manual removal of all soil and debris by brushing followed by steam cleaning.
- B. If necessary, a temporary decontamination pad shall be constructed by the Contractor in an area or areas approved by Owner's Representative. The decontamination pad shall provide a watertight surface for draining and collected rinse waters, capable of supporting all equipment requiring decontamination. All washing activities shall take place on the decontamination pad unless otherwise approved by Owner's Representative. Thorough brushing down of equipment shall be conducted within the work area prior to final rinsing above the decontamination pad so as to minimize the amount of soils and sediments collected.
- C. Steam cleaning shall be conducted with equipment and in a manner to minimize the generation of decontamination waters. If decontamination is conducted within excavation areas, and if approved by the Owner's Representative, decontamination water will be permitted to infiltrate into the ground. Otherwise, decontamination water shall be collected and containerized by Contractor for subsequent off-site disposal or on-site treatment as directed by Owner's Representative.

### **3.16 *Final Surveying***

- A. The Contractor shall complete as-built surveying of the Work during and/or after construction as necessary to document the extent and location of the corrective measures. As-built surveying shall include the location, extent and depth of all excavation areas, final grades and surface coverage, extent of any new vegetation or pavement placed, and any other constructed or altered site features.

- B. Contractor shall provide 3 copies of the completed survey information to the Owner's Representative prior to the receipt of final payment.
- C. All surveying shall be performed by a Pennsylvania-licensed professional land surveyor.

***END OF SECTION***



## **SECTION 02225 - ASPHALT PAVEMENT**

### **1.0 GENERAL**

#### **1.1 Work Included**

- A. Preparation of Subgrade
- B. Placement and Compaction of Aggregate Subbase
- C. Placement and Compaction of Bituminous Concrete Base Course
- D. Placement and Compaction of Wearing Course
- E. Seal Coat Paved Surfaces

#### **1.2 Related Work**

- A. Section 02000 – Excavation and Backfilling.

#### **1.3 References**

- A. Pennsylvania DOT Standard Specifications Section 400 – Flexible Pavements
- B. Pennsylvania DOT Standard Specifications Section 305 – Bituminous Concrete Base Course (Standard)
- C. Pennsylvania DOT Standard Specifications Section 470 – Bituminous Seal Coat
- D. Pennsylvania DOT Standard Specifications Section 430 – Bituminous Wearing Course (FB-2)
- E. Pennsylvania DOT Standard Specifications Section 401.2 – Material
- F. ASTM D698 – Moisture-Density Relations of Soil and Soil-Aggregate

#### **1.4 Quality Assurance**

- A. Perform work in general accordance with the applicable provisions of Pennsylvania DOT Standard Specifications listed above, and the Drawings and Specifications.
- B. Obtain materials only from sources approved by the Owner's Representative.

**1.5*****Submittals***

- A. All submittals required under this section shall be submitted to Owner's Representative for approval at least one week prior to the delivery of the applicable materials to the Site.
- B. Submit for approval the name and location of the proposed source(s) for aggregate and pavement materials, along with certification or sampling results to document that the materials are free of synthetic organic or inorganic contamination.
- C. Submit for approval copies of test results indicating that the materials meet the gradation and other requirements of this section, and results of compaction testing of the subbase aggregate materials performed in accordance with ASTM D-698.

**1.6*****Delivery, Storage, and Handling of Materials***

- A. Materials shall be delivered to the site only after the required submittals have been approved.

**1.7*****Placement Schedule***

- A. Materials shall be placed to the extent, thickness, lines and grades shown on the Drawings.
- B. No aggregate subbase or bituminous pavement layer shall be placed until the prepared surfaces to receive such layers have been inspected and approved by the Owner's Representative.

**2.0*****PRODUCTS*****2.1*****Subbase Aggregate***

- A. Subbase course aggregate shall be Pennsylvania DOT 2A-Modified dense-graded aggregate, or similar aggregate approved by Owner's Representative. It shall not contain debris, roots, frozen materials, or organic matter.
- B. Existing aggregate within the area scheduled for pavement placement may be re-used to the extent possible.

**2.2*****Bituminous Concrete Base Course***

- A. Bituminous concrete base course materials shall meet the requirements of Pennsylvania DOT Section 305 for Standard Bituminous Concrete Base Course.

### **2.3**      *Bituminous Wearing Course*

- A. Bituminous concrete wearing course aggregate shall be in accordance with Pennsylvania DOT Section 430 – Bituminous Wearing Course (FB-2).

### **2.4**      *Seal Coat*

- A. Bituminous concrete wearing course aggregate shall be in accordance with Pennsylvania DOT Section 470 – Bituminous Seal Coat.

## **3.0**      *EXECUTION*

### **3.1**      *General*

- A. Pavement shall be constructed over the backfilled SWMU 17 excavation areas that were not previously vegetated.
- B. Pavement construction activities shall be coordinated with on-going site operations to minimize potential disruptions.
- C. The asphalt surface and all underlying layers shall be constructed to the lines, grades, and thicknesses shown on the Drawings. In general, this means restoring the area to the pre-existing elevations, and flush with adjacent areas.
- D. The asphaltic concrete surface shall be sealed against all structures and protrusions as appropriate.

### **3.2**      *Aggregate Subbase Course Placement*

- A. Aggregate shall be placed and compacted to the extent, thicknesses and grades shown on the Drawings or as otherwise approved or designated by the Owner's Representative. Each lift shall be no greater than 8 inches in compacted thickness. Compaction shall be as required to achieve a firm, stable and freely draining surface. The aggregate shall be compacted to a dry density of no less than 100% of the maximum dry density determined by ASTM D-698.
- B. Aggregate shall not be placed or compacted when the subgrade is frozen or when it is unstable because of excessive moisture. Contractor shall recompact or otherwise rework subgrade areas determined to be unacceptable for aggregate placement.

**3.3 Bituminous Concrete Base Course Placement**

- A. Bituminous concrete base course shall be placed according to the applicable specifications of Pennsylvania DOT Section 305.

**3.4 Field Quality Control- Bituminous Concrete Base Course**

- A. Contractor shall perform compaction testing determined through measurement of actual pavement density using a nuclear density gauge in accordance with ASTM D 2950 - Density of Bituminous Concrete in Place by Nuclear Method. Owner's Representative may perform additional confirmation testing at his/her discretion.
- B. If tests indicate that Work does not meet the specified thickness or density requirements, Contractor shall remove and replace, recompact, repair, or otherwise correct the Work at no additional cost to Owner.
- C. The Contractor shall ensure that the bituminous concrete base course surface grade is smooth and will be consistent with planned final grades following wearing course placement.

**3.5 Preparation - Bituminous Concrete Wearing Course**

- A. Contractor shall inspect base course layer with Owner's Representative to verify appropriate conditions prior to placement of bituminous concrete wearing course.
- B. Contractor shall rework/reinstall base course areas determined to be unacceptable for wearing course placement.

**3.6 Bituminous Concrete Wearing Course Placement**

- A. Material shall be placed to the extent, thicknesses and grades shown on the Drawings and in accordance with this Specification, or as otherwise approved or designated by the Owner's Representative.
- B. Materials shall be placed according to the applicable specifications of Pennsylvania DOT Section 430.

**3.7 Field Quality Control - Bituminous Concrete Wearing Course**

- A. Contractor shall perform compaction testing determined through measurement of actual pavement density using a nuclear density gauge in accordance with ASTM D 2950 - Density of Bituminous Concrete in Place by Nuclear Method. Owner's Representative may perform additional confirmation testing at his/her discretion.

- B. If tests indicate that Work does not meet the specified thickness or density requirements, Contractor shall remove and replace, recompact, repair, or otherwise correct the work at no additional cost to Owner.
- C. The Contractor shall ensure that the final surface grade is smooth and in compliance with the elevations and grades indicated on the Drawings.

### 3.8

#### *Seal Coat Placement*

- A. Seal coat shall be applied in a general accordance with Pennsylvania DOT Standard Specifications Section 470. Bituminous material shall be applied at a rate of 0.15 to 0.20 gallons per square yard unless otherwise approved by Owner's Representative.
- B. Contractor shall clean all areas scheduled for seal coating so that all areas are free from deposits of dirt, loose stone or other objectionable material before application of the seal coat.
- C. Each surface shall be approved by the Owner's Representative prior to application of seal coat.
- D. Seal coat shall be placed on all finished asphalt surfaces.

***END OF SECTION***

## **SECTION 02936 - SEEDING**

### **1.0 GENERAL**

#### **1.1 Work Included**

- A. Fertilizing
- B. Seeding
- C. Mulching
- D. Maintenance

#### **1.2 Related Work**

- A. Section 02000 - Excavation and Backfilling

#### **1.3 References**

- A. Standards for Erosion and Sedimentation Control in Pennsylvania.
- B. Pennsylvania State University, College of Agricultural Science Agronomy Guide.

#### **1.4 Definitions**

- A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

#### **1.5 Regulatory Requirements**

- A. Comply with regulatory agencies for fertilizer and herbicide composition.

#### **1.6 Quality Assurance**

- A. Submit manufacturer's/supplier's specifications for the seed mixture and fertilizer to the Owner's Representative for approval at least one week prior to seeding.

- B. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

## 1.7 *Maintenance Data*

- A. Submit recommended data for continued vegetative cover maintenance to the Owner's Representative prior to Contractor demobilization.
- B. Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

## 1.8 *Delivery, Storage, and Handling*

- A. Grass seed mixture shall be delivered in sealed containers labeled in conformance with U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

## 2.0 *PRODUCTS*

### 2.1 *Seed Mixture*

- A. Unless otherwise approved by Owner's Representative, areas to be vegetated shall receive the following Permanent Seeding Mixture:

<u>Species</u>	<u>Seeding Rate</u>
1. Crown Vetch	15 lbs/acre
2. Tall Fescue	25 lbs/acre
3. Annual Rye Grass	20 lbs/acre

### 2.2 *Accessories*

- A. Erosion Matting: EXCELL Erosion matting (or approved equivalent) and sod staples.
- B. pH Adjuster: Dolomitic limestone shall be applied at the rate of 2 tons per acre.
- C. Fertilizer: 10-10-10 fertilizer shall be applied at a rate of 435 pounds per acre.

- D. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.
- E. Mulching Material: Straw mulch shall be unrotted, small grain straw that is free of weeds.

### 3.0 ***EXECUTION***

#### 3.1 ***Inspection***

- A. Verify that prepared soil base is ready to receive the work of this Section.

#### 3.2 ***Erosion Matting***

- A. Erosion matting shall be installed as temporary stabilization in all areas of soil disturbance as necessary until permanent vegetation can be established.
- B. Erosion matting shall be installed per manufacturer's recommendations.
- C. If surface water runoff, continuously flowing water, or other conditions potentially hamper the success of seeding activities, even when erosion matting is used, Contractor shall discuss alternate options with the Owner's Representative to ensure adequate stabilization. Such alternate options include the placement of upslope straw bales to decrease the velocity of stormwater runoff, diversion berms or swales to reduce runoff, and/or the use of heavier armoring such as aggregate or rip-rap. Any such alternate measures shall be designed and implemented in accordance with all applicable Erosion and Sedimentation Control requirements.

#### 3.3 ***Fertilizing***

- A. If required, apply limestone at a rate recommended by soil test laboratory and/or seed supplier. Work into soil to a depth of 4 inches.
- B. Apply fertilizer at a rate recommended by soil test laboratory and/or seed supplier. Mix fertilizer thoroughly into the upper 4 inches of topsoil. Lightly add water to aid the dissipation of fertilizer.
- C. Apply after smooth raking of topsoil.



- D. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

### 3.4 *Seeding*

- A. Apply seed at rate indicated, evenly and in two intersecting directions. Rake seed in lightly. Do not seed areas in excess of that which can be mulched on same day.
- B. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- C. Immediately following seeding, apply mulch at a rate of at least 3 tons per acre.
- D. Apply water with a fine spray immediately after each area has been mulched. Saturate to a depth of 4 inches.

### 3.5 *Hydroseeding (optional)*

- A. Apply seeded slurry at the equivalent rate for the seed mixture as indicated, and evenly in two intersecting directions, with a hydraulic seeder. Do not hydroseed areas in excess of that which can be mulched on same day.
- B. Immediately following seeding, apply mulch to a thickness of 1/8 inches at a rate of at least 3 tons/acre. Wood-fiber or paper-fiber mulch at a rate of 1500 pounds per acre may be applied by a hydroseeder on flatter slopes during optimum seeding periods in spring and fall.
- C. Apply water with a fine spray immediately after each area has been mulched. Saturate to a depth of 4 inches.

### 3.6 *Seed Protection*

- A. Seed protection shall be placed according to manufacturer's recommendations or as otherwise approved by Owner's Representative.

### 3.7 *Establishment of Vegetative Cover*

- A. Contractor is responsible for insuring that an effective grass cover as determined by the CQA Inspector is established over all disturbed areas. Effective cover will be considered as a functional cover over at least 70% of the disturbed area.

**END OF SECTION**